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# Predictors of multiple intelligence abilities for Malaysian school leaders

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## Abstract

Intelligence is a trait that is commonly believed to be important to effective leadership. This study was conducted to identify multiple intelligence abilities and their relationships with personal factors of a group of Malaysian school leaders (n=287). It also examined the predictors of overall multiple intelligence. A psychological test - the Multiple Intelligences Test was used to collect data from the subjects. Results show that multiple intelligence abilities are inter-correlated significantly. However, 7.1% the correlation are below  $r = .60$ . Interpersonal and intrapersonal are the highest multiple intelligence abilities of the school leaders while naturalistic, bodily-kinesthetic and musical-rhythmic are at their lowest level. The results indicate that the more working experience gained by a school leader, the higher the level of interpersonal and intrapersonal abilities developed. The results of multiple regression analysis show that for the school leaders, interpersonal and intrapersonal intelligence are the two best predictors of overall multiple intelligence. The findings of this study have important potential theoretical and practical implications for school leaders.

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## 1. Introduction

Effective leadership is viewed as the foundation for organizational performance and growth (Vardiman, Houghton and Jinkerson, 2006). It drives the competitive environment for organizational survival (Amagoh, 2009) and intelligence is a trait that is commonly believed to be important for effective leadership (Judge, Ilies, and Colbert, 2004). Educational leaders who are efficient and who know how to solve multiple problems in any given context, and leaders who use their multiple intelligence abilities effectively in the school environment can help to promote these goals. If organizations connect leadership development with the domains of multiple intelligences, they will create a culture similar to the ideas of a learning organization (Kline and Saunders, 1998).

The limitations of early research on intelligence and leadership can be traced to the focus on traditional IQ-based notions of intelligence (Gale, 2012). Some researchers today prefer to link educational leadership to multiple intelligences. This is because educational institutions are demanding effective leaders who have developed multiple intelligences, knowledge and skills, who are capable of setting and achieving their goals, who know how to search

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for information to improve performance and achievement, and who know how to work cooperatively and effectively with large numbers people with different characteristics and styles and from different backgrounds, including parents, teachers and students.

The theory of multiple intelligences proposed by Howard Gardner (1983) is a model of intelligence that differentiates human's intelligences into specific modalities. The intelligences included in the theory are logical-mathematical, verbal-linguistic, visual-spatial, musical-rhythmic, interpersonal, intrapersonal, bodily-kinesthetic and naturalistic. According to Gardner, none of these intelligences is to be considered superior to the others. The different intelligences are understood as personal tools and a person may be more talented in some than in others (Mirzazadeh, 2012). Gardner (1983) argues that there are in fact very weak correlations among the multiple intelligence abilities. However, the relationship between multiple intelligences and leadership is unclear (Gale, 2012). A careful review of the literature found no study of predictors for the multiple intelligence abilities of educational leaders. Two studies, however, focused on the association with student learning (Zarei and Mohseni, 2012). Adrian and Shagabutdinova (2012) reported that verbal, logical, and spatial intelligences were the best predictors of overall multiple intelligence for Russian university students ( $n=230$ ). However, the result is inconsistent with the finding of Adrian, Agata and Petrides (2005), who reported that the most consistent predictors of estimated general intelligence for Poland students ( $N = 258$ ) were verbal, mathematical, and intrapersonal intelligence. More studies need therefore to be carried out on predictors of the multiple intelligence abilities of educational leaders, in order to provide a clearer picture. Evidence of this kind would be of value to educational institutions in training and leadership development, and in the selection of future educational leaders.

A further problem is that even though not many research projects have focused on the relationship between multiple intelligence abilities and personal factors such as gender, age level, working experience, grade of service, job position in school and academic background, the findings of those that have been done are inconsistent (Mirzazadeh, 2012; Gale, 2012; Adrian and Shagabutdinova, 2012; Adrian, Shahriar and Bahman, 2012; Adrian, Agata and Petrides, 2005). This raises the two questions investigated here. The first is concerned with what level of multiple intelligence abilities is achieved by Malaysian school leaders. The second is whether the multiple intelligence abilities of school leaders are significantly associated with their personal variables. These speculations need further research evidence before any wider generalization can be made. The objectives of this study are therefore to identify multiple intelligence abilities and their relationship with personal factors. It also examines the predictors for the multiple intelligence abilities of Malaysian school leaders.

## 2. Methods

The study used a non-experimental research design. A survey was conducted to collect quantitative data by means of a psychological paper-and-pencil test.

### 2.1. Subjects

The subjects were 287 school leaders, including 200 secondary school principals and 87 primary school headmasters. They were selected randomly from eight states in Malaysia, namely Kelantan, Terengganu, Perak, Wilayah Persekutuan ('Federal Territory'), Selangor, Pahang, Johor and Penang. They included 183 males and 104 females, the majority being over 40 ( $n= 267$ ). Nearly half had at least 25 years of working experience in school ( $n=139$ ), while only 12.5% ( $n=36$ ) had less than 15 years of experience. More than half had a first degree ( $n=166$ ), while 79 had a diploma, and 42 had MA degrees.

### 2.2. Instrumentation and data collection

A psychological test, the Multiple Intelligences Test, was used to collect data from the subjects. This test has two sections. Section A collects data for personal variables, including gender, age, working experience in school, grade of service, position in school and academic level. Section B collects data for multiple intelligences, and consists of

64 items on a five point Likert scale which is used to identify eight multiple intelligence abilities as defined by Gardner (2006), namely verbal-linguistic, logical-mathematical, visual-spatial, musical-rhythmic, interpersonal, intrapersonal, bodily-kinaesthetic, and naturalistic. The time allocated for answering the test is 30 minutes. The school leaders took the test individually in their own schools. A reliability study was carried out in advance of the main study on a group of school leaders ( $n=30$ ) with similar characteristics to those of the subjects of the main study. The internal consistency reliability coefficients for the eight multiple intelligences in the pilot study were between .67 and .89. The test was accordingly considered reliable for collecting data from the main sample of 287 school leaders (Chua, 2006).

### 3. Results

#### 3.1. Inter-correlations among multiple intelligence abilities

The results of the Pearson correlation test presented in Table 2 show that there are positive and significant inter-correlations among the eight multiple intelligence abilities. The strengths of the correlation are between  $r = .28$  and  $r = .71$ . This means that the eight multiple intelligence abilities are inter-correlated.

Table 1: Inter-correlation among multiple intelligence abilities

Pearson correlation	1	2	3	4	5	6	7	8
1. Verbal-linguistic	1							
2. Logical-mathematical	.51**	1						
3. Visual-spatial	.54**	.48**	1					
4. Musical-rhythmic	.25**	.21**	.49**	1				
5. Interpersonal	.65**	.45**	.53**	.28**	1			
6. Intrapersonal	.55**	.50**	.52**	.35**	.71**	1		
7. Naturalistic	.39**	.39**	.41**	.24**	.32**	.28**	1	
8. Bodily-kinesthetic	.46**	.37**	.49**	.50**	.50**	.42**	.45**	1

Note: \*\* significant at 0.01.

#### 3.2. Comparison of the multiple intelligence abilities of the school leaders

The results of the one-way ANOVA test (Table 3) show that there are significant differences among the multiple intelligence abilities of the school leaders [ $F(7, 288) = 83.19$ ,  $p < .05$ ]. Five of the multiple intelligence abilities are identified as at high level (interpersonal, intrapersonal, logical-mathematical, visual-spatial and verbal-linguistic) while three of them are at average level (naturalistic, bodily-kinaesthetic and musical-rhythmic). None of the multiple intelligences are at low level.

Table 2: level of multiple intelligence abilities of the school leaders

Multiple intelligences	Mean	SD	Level	F(7, 288)
Interpersonal	4.11	.47	High	83.19**
Intrapersonal	4.02	.47	High	
Logical-mathematical	3.76	.50	High	
Visual-spatial	3.76	.51	High	
Verbal-linguistic	3.72	.50	High	
Naturalistic	3.41	.83	Average	
Bodily-kinaesthetic	3.29	.63	Average	
Musical-rhythmic	3.20	.82	Average	

Note: Level of multiple intelligence abilities: Low: 1.00 to 2.50; average: 2.51 to 3.49; high 3.50 to 5.00.

#### 3.3. The relationship between multiple intelligences and personal factors

The results of the multiple regression analysis indicate no significant correlation between total multiple intelligence, musical-rhythmic, naturalistic and bodily-kinaesthetic with personal variables. However, gender is a

positive factor for verbal-linguistic intelligence ( $\beta = .13$ ,  $R^2 = .017$ ,  $p < .01$ ) and logical-mathematical intelligence ( $\beta = -.12$ ,  $R^2 = .014$ ,  $p < .01$ ). Age also emerges as a negative factor for visual-spatial intelligence ( $\beta = -.13$ ,  $R^2 = .016$ ,  $p < .01$ ). Working experience is a positive and significant factor for interpersonal and intrapersonal abilities, and contributes 34.8% for interpersonal intelligence ( $\beta = .59$ ,  $R^2 = .348$ ,  $p < .01$ ), and 21.2% for intrapersonal intelligence ( $\beta = .46$ ,  $R^2 = .212$ ,  $p < .01$ ).

### 3.4. Predictors of overall multiple intelligence

The multiple linear regression analysis presented in Table 5 indicates that estimates of interpersonal, intrapersonal, verbal, logical, and spatial intelligences were the best predictors of estimates of overall intelligence. The two main predictors – interpersonal and intrapersonal significantly predicted 78.7% of the total variance of overall multiple intelligence.

Table 3: Factors of multiple intelligences

Multiple intelligence ability	Factor	$\beta$	$R^2$	F(1, 285)
Verbal-linguistic	Gender	.13	.017	4.96**
Logical-mathematical	Gender	-.12	.014	4.13**
Visual-spatial	Age	-.13	.016	4.50**
Musical-rhythmic	-	-	-	-
Interpersonal	Working experience in school	.59	.348	33.67**
Intrapersonal	Working experience in school	.46	.212	25.74**
Naturalistic	-	-	-	-
Bodily-kinaesthetic	-	-	-	-
Total	-	-	-	-

Note: \* significant at  $p < .05$ ; \*\* significant at  $p < .01$

Table 4: Predictors of overall multiple intelligence

Multiple intelligence ability	B	$R^2$	F(1, 285)
Interpersonal	.15	.600	420.22
Intrapersonal	.18	.787	524.77
Verbal-linguistic	.14	.866	607.27
Logical-mathematical	.24	.927	898.88
Visual-spatial	.25	.952	1106.64
Musical-rhythmic	.15	.980	2296.80
Naturalistic	.14	.992	5428.01
Bodily-kinaesthetic	.14	1.00	-

## 4. Summary of results and discussion

The results of a Pearson correlation analysis show that the eight multiple intelligence abilities are inter-correlated significantly. However, only two of 28 correlations or 7.1% are below  $r = .60$ . This finding is consistent with the claim of Gardner (1983) that there were weak inter-correlations among multiple intelligence abilities. It indicates that the multiple intelligence abilities of the school leaders are functioning together. In addition, interpersonal and intrapersonal intelligences are the highest multiple intelligence abilities of the school leaders while the lowest multiple intelligence abilities are naturalistic, bodily-kinaesthetic and musical-rhythmic. According to Gardner (2006), multiple intelligence abilities are needed for effective school administration and management, and effective leadership is a systematic process which needs high interpersonal, intrapersonal, logical-mathematical and visual-spatial skills. The finding is consistent with the finding of Gale (2012) that interpersonal skill is a significant measure of quality leadership. However, the study implies that school leaders need to improve their naturalistic, bodily-kinaesthetic and musical-rhythmic abilities since they need multiple skills for school effectiveness and improvement.

The results indicate that gender is a positive factor in verbal-linguistic and logical-mathematical abilities. The female school leaders possessed greater verbal-linguistic ability than the males, while the males possessed greater logical-mathematical ability than their counterparts. The results also show that increasing age is indirectly associated with decreasing visual-spatial ability among the school leaders, and that working experience in school is a positive

factor for interpersonal and intrapersonal abilities. The longer the working experience obtained by school leaders, the higher the level of interpersonal and intrapersonal abilities they are likely to have developed

The multiple linear regression analysis indicates that interpersonal and intrapersonal intelligence are the two best predictors of overall multiple intelligence in the school leaders. This finding is inconsistent with findings of Andrian and Shagabutdinova (2012), who reported that verbal, logical, and spatial intelligences were the best predictors of estimates of overall multiple intelligences. A possible explanation for the inconsistency in these findings is that their study was carried out on students, and looked for the verbal, logical and spatial intelligences necessary for the learning process (Gardner, 1983).

The findings of this study have potential theoretical and practical implications for school leaders concerning their multiple intelligence abilities and their relationship to certain demographic factors. However, the generalizability of the present study is limited by the small sample size. A larger sample size would be more reliable. Secondly, the limitation of the sample by virtue of the homogeneity of nationality and occupation should also be noted. Despite these limitations, the findings provide a deeper and broader understanding of multiple intelligences in school leaders, which itself could have consequences for the selection of leaders, for training, and for the future development of educational institutions.

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